# KAMIAH LDS CHURCH (PWS # 2250130)
# SOURCE WATER ASSESSMENT FINAL REPORT

**February 26, 2002**

## State of Idaho
## Department of Environmental Quality

## Executive Summary

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems. The assessment for your particular drinking water source is based on a land use inventory within a 1,000-foot radius of your drinking water source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

This report, *Source Water Assessment for Kamiah LDS Church: Public Water System (PWS) #2250130* describes the public drinking water system, the associated potential contaminant sources located within a 1,000-foot boundary around the drinking water source, and the susceptibility (risk) that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should not be used as an absolute measure of risk and is not intended to undermine the confidence in your water system.**

The *Kamiah LDS Church* drinking water system consists of a single well. The system has a high susceptibility to inorganic contaminants (IOCs), volatile organic contaminants (VOCs), synthetic organic contaminants (SOCs), and microbial contaminants. According to the 1996 sanitary survey, a river water reservoir is located within 50 feet of the wellhead, giving the LDS church well an automatic high susceptibility rating to all potential contaminants. If this source were relocated away from the wellhead, the system would have a moderate susceptibility rating.

The initial computer generated contaminant source inventory conducted by the DEQ located one potential contaminant source within the 1,000-foot boundary. Additionally, the geographic information system (GIS) map shows that the well lies within 1000 feet of Highway 12 (Table 1). Also, the 1996 sanitary survey indicates that the wellhead is within 50 feet of a river water reservoir. Although this source is not included in the table below, it was used in assessing the susceptibility of the well. A copy of the susceptibility analysis worksheet for your system along with a map showing any potential contaminant sources is included with this summary.

**Table 1. Kamiah LDS Church, Potential Contaminant Inventory**

| SITE # | Source Description[1] | Source of Information | Potential Contaminants[2] |
|---|---|---|---|
| 1 | UST-Open | Database Search | VOC, SOC |
| | Highway 12 | GIS Map | IOC, VOC, SOC, Microbials |

**[1]UST = underground storage tank**
**[2]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical**

## Susceptibility Analysis

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the

well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

**Hydrologic Sensitivity**

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity is moderate for the well. Regional soil data indicates the presence of moderate to well draining soils surrounding the well. However, the well log indicates the presence of several layers of clay totaling 70 feet above the producing zone. These low permeable layers can potentially reduce the downward migration of contaminants to the aquifer. Depth to first ground water is found at 285 feet.

**Well Construction**

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Kamiah LDS Church drinking water well rated moderate susceptibility for system construction. The 1996 sanitary survey indicates that the wellhead and surface seals are maintained to standards but that the wellhead vent was not properly constructed to protect the well from surface flooding. However, this vent was reconstructed in 2001 to meet well construction standards. The well log provided some well construction information.

The well was drilled in 1979 to a depth of 410 feet. It has a 0.250-inch thick, 6-inch diameter casing set to a depth of 140 feet into “blue clay.” The annular seal was installed to a depth of 20 feet into “cobble stones.” The well log indicates that the highest production interval is found between 290 and 410 feet with the static water level at 95 feet. Though the well may have met construction standards at the time of installation, current well construction standards are more stringent.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A 6-inch diameter well requires a casing thickness of 0.280-inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate.

**Potential Contaminant Source and Land Use**

The well rated low for IOCs (e.g., arsenic, nitrate), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and microbial contaminants (e.g., bacteria). The rangeland that surrounds the well and the limited number of contaminants within the delineated area reflect the low land use scores.

**Final Susceptibility Rating**

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, having potential contaminant sources within 50 feet of the wellhead will give an automatic high susceptibility rating. In this case, a river water reservoir is located within 50 feet of the wellhead, giving an automatic high susceptibility to all potential contaminant categories. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the well has a high susceptibility to IOCs, VOCs, SOCs, and microbial contaminants.

## Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Kamiah LDS Church, drinking water protection activities should focus on implementation practices aimed at maintaining well construction and protection of the well to avoid contamination from contaminant sources within the designated source water area. When it is feasible for the Kamiah LDS Church, the river water reservoir should be relocated to an area greater than 50 feet from the wellhead. Partnerships with state and local agencies and industry groups should be established and are critical to success. You may want to establish a dialog with the relevant state and local agencies related to wellhead protection. Drinking water protection

activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. EPA. For areas where transportation corridors transect the delineation, the Department of Transportation should be included in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

**Assistance**

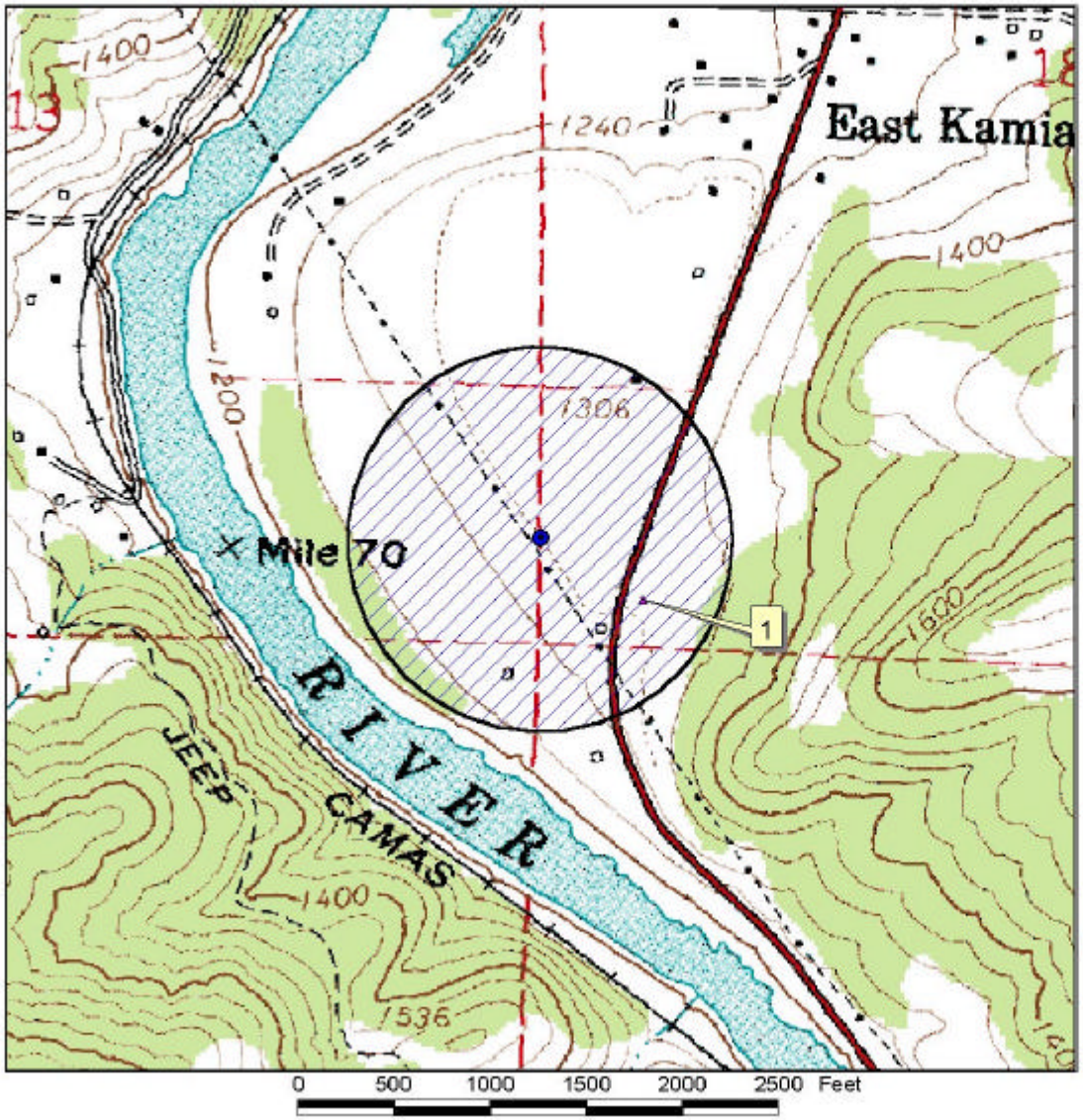
Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

| | |
|---|---|
| Lewiston Regional DEQ Office | (208) 799-4370 |
| State DEQ Office | (208) 373-0502 |

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with drinking water protection (formerly wellhead protection) strategies.

# Kamiah LDS Church: Original Well
# PWS Number: 2250130




## LEGEND

N

- 1B (3 yr TOT)
- Wellhead
- Enhanced Inventory
- CERCLIS Site
- RICRIS Site
- Dairy
- LUST Site
- Closed UST Site
- Open UST Site
- Business Mailing List
- NPDES Site
- Mine
- AST
- Toxic Release Inventory
- SARA Title III Site (EPCRA)
- Recharge Point
- Injection Well
- Group1 Site
- Cyanide Site
- Landfill
- Wastewater Land App.Site

**POTENTIAL CONTAMINANT INVENTORY**
**LIST OF ACRONYMS AND DEFINITIONS**

**AST (Aboveground Storage Tanks) –** Sites with aboveground storage tanks.

**Business Mailing List –** This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS –** This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site –** DEQ permitted and known historical sites/facilities using cyanide.

**Dairy –** Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well –** Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

**Floodplain –** This is a coverage of the 100year floodplains.

**Group 1 Sites –** These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area –** Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill –** Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area –** Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System) –** Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas –** These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point –** This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS –** Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) –** These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank) –** Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

**Wellheads –** These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report  Public Water System Name : KAMIAH LDS CHURCH  Well# : ORIGINAL WELL

Public Water System Number 2250130  2/11/02 12:48:51 PM

| 1. System Construction | | SCORE |
|---|---|---|
| Drill Date | 7/9/79 | |
| Driller Log Available | YES | |
| Sanitary Survey (if yes, indicate date of last survey) | YES | 1996 |
| Well meets IDWR construction standards | NO | 1 |
| Wellhead and surface seal maintained | YES | 0 |
| Casing and annular seal extend to low permeability unit | NO | 2 |
| Highest production 100 feet below static water level | YES | 0 |
| Well located outside the 100 year flood plain | YES | 0 |
| | Total System Construction Score | 3 |

| 2. Hydrologic Sensitivity | | |
|---|---|---|
| Soils are poorly to moderately drained | NO | 2 |
| Vadose zone composed of gravel, fractured rock or unknown | YES | 1 |
| Depth to first water > 300 feet | NO | 1 |
| Aquitard present with > 50 feet cumulative thickness | YES | 0 |
| | Total Hydrologic Score | 4 |

| 3. Potential Contaminant / Land Use - ZONE 1A | | IOC Score | VOC Score | SOC Score | Microbial Score |
|---|---|---|---|---|---|
| Land Use Zone 1A | RANGELAND, WOODLAND, BASALT | 0 | 0 | 0 | 0 |
| Farm chemical use high | NO | 0 | 0 | 0 | |
| IOC, VOC, SOC, or Microbial sources in Zone 1A | YES | YES | YES | YES | YES |
| Total Potential Contaminant Source/Land Use Score - Zone 1A | | 0 | 0 | 0 | 0 |
| **Potential Contaminant / Land Use - ZONE 1B** | | | | | |
| Contaminant sources present (Number of Sources) | YES | 1 | 2 | 2 | 1 |
| (Score = # Sources X 2 ) 8 Points Maximum | | 2 | 4 | 4 | 2 |
| Sources of Class II or III leacheable contaminants or | YES | 1 | 2 | 2 | |
| 4 Points Maximum | | 1 | 2 | 2 | |
| Zone 1B contains or intercepts a Group 1 Area | NO | 0 | 0 | 0 | 0 |
| Land use Zone 1B | Less Than 25% Agricultural Land | 0 | 0 | 0 | 0 |
| Total Potential Contaminant Source / Land Use Score - Zone 1B | | 3 | 6 | 6 | 2 |
| **Cumulative Potential Contaminant / Land Use Score** | | 3 | 6 | 6 | 2 |
| **4. Final Susceptibility Source Score** | | 8 | 9 | 9 | 8 |
| **5. Final Well Ranking** | | High | High | High | High |